

NON-PUBLIC?: N
ACCESSION #: 8911220017
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Joseph M. Farley - Unit 2 PAGE: 1 OF 03

DOCKET NUMBER: 05000364

TITLE: Reactor Trip Caused By Design Error In The Digital Electro-hydraulic Control System
EVENT DATE: 10/18/89 LER #: 89-012-00 REPORT DATE: 11/14/89

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: D.N. Morey, General Manager - TELEPHONE: (205)899-5156
Nuclear Plant

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

At 1407 on 10-18-89, with the unit operating at 100% power, the reactor tripped due to lo-lo steam generator level. The lo-lo steam generator level occurred when the turbine generator governor valves closed. This closure resulted from a digital electro-hydraulic control (DEHC) system design feature enhancement which causes the governor valve position limiter to lower to zero as a backup to closing the governor valves when both overspeed protection channel (OPC) power supplies fail.

This event was caused by a design error in the DEHC system. This error allowed a momentary data loss to be created when the operator requested the "Re-enable Highway" function at the DEHC Operators/Alarms Console. This resulted in the same system control action that is taken when both OPC power supplies fail.

The valve position limiter feature which lowers to zero as a backup to closing the governor valves when the OPC power supplies fail has been removed from the Unit 1 and Unit 2 DEHC systems. Westinghouse has been directed to determine if there are other DEHC features available to the operator which may cause a turbine trip or turbine valve closure.

END OF ABSTRACT

TEXT PAGE 2 OF 3

Plant and System Identification

Westinghouse - Pressurized water Reactor

Energy Industry Identification System codes are identified in the text as XX!.

Summary of Event

At 1407 on 10-18-89, with the unit operating at 100% power, the reactor AB! tripped due to lo-lo steam generator level. The lo-lo steam generator level occurred when the turbine generator TB! governor valves closed. This closure resulted from a digital electro-hydraulic control (DEHC) system design feature enhancement which causes the governor valve position limiter to lower to zero as a backup to closing the governor valves when both overspeed protection channel (OPC) power supplies fail.

Description of Event

On 10-18-89, the unit was operating in steady state at 100% power. A Unit Operator was investigating a problem with the generator stator temperature alarm. He pressed the DEHC selector for the system status function while he was trying to determine the cause of the alarm. Once in this system status function group he selected "Re-enable Highway", a subgroup. When this was depressed, the turbine governor valve position limiter was automatically run to a minimum. This caused the governor valves to go closed and the subsequent reactor trip. The valve position limiter function of the DEHC had been installed to run the limiter to zero in the event that both overspeed protection channel power supplies failed. The DEHC design was such that when the operator requested the "Re-enable Highway" function, the same system control action results as when both OPC power supplies fail. This in turn actuates the governor valve closure.

Following the trip, the operators implemented FNP-2-EOP-0 (Reactor Trip or Safety Injection) and FNP-2-ESP-0.1 (Reactor Trip Response), ensuring that the unit was safely in Mode 3 (Hot Standby). The unit was

maintained in a normal stable condition.

Cause of Event

This event was caused by a design error in the DEHC system. This error allowed a momentary data loss to be created when the operator requested the "Re-enable Highway" function at the DEHC Operators/Alarms Console. This resulted in the same system control action that is taken when both OPC power supplies fail.

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Reportability Analysis and Safety Assessment

This event is reportable because of the actuation of the reactor protection system. After the trip, the following safety systems operated as designed: main feedwater was isolated with flow control valves and bypass valves closed, auxiliary feedwater pumps started automatically and provided flow to the steam generators, source range nuclear instrumentation automatically energized, and pressurizer heaters and spray valves operated as required to maintain system pressure. There was no effect on the health and safety of the public.

Corrective Action

The valve position limiter feature which reverts to zero as a backup to closing the governor valves when the OPC power supplies fail has been removed from the Unit 1 and Unit 2 DEHC systems. In addition, the DEHC system status selector switch has been caution tagged to prevent its operation without the support of Computer Services personnel until additional training is given to plant operators concerning the system status function.

Westinghouse has been directed to determine if there are other DEHC features available to the operator which may cause a turbine trip or turbine valve closure.

Additional Information

The unit returned to criticality on 10-19-89 at 0600.

No similar LERs have been submitted by Farley Nuclear Plant.

No components failed during this event.

This event would not have been more severe if it had occurred under

different operating conditions.

ATTACHMENT 1 TO 8911220017 PAGE 1 OF 1

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W.G. Hairston, III
Senior Vice President November 14, 1989
Nuclear Operations

Alabama Power
the southern electric system

10 CFR 50.73

Docket No. 50-364

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Dear Sir:

Joseph M. Farley Nuclear Plant - Unit 2
Licensee Event Report No. LER 89-012-00

Joseph M. Farley Nuclear Plant, Unit 2, Licensee Event Report No. LER 89-012-00 is being submitted in accordance with 10CFR50.73.

If you have any questions, please advise.

Respectfully submitted,

W.G. Hairston, III

WGH,III/JAR:md 8.46

Enclosure

cc: Mr. S.D. Ebnetter
Mr. G.F. Maxwell

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